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| 10/542,636 | 07/19/2005 | Gerald Chambon | Q89149 | 6921 |

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| EXAMINER | |
|---|---|
| NGUYEN, HOAI AN D | |

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| 2831 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/542,636 | CHAMBON ET AL. | |
| | Examiner | Art Unit | |
| | HOAI-AN D. NGUYEN | 2831 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *13-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *18 and 28* is/are allowed.

6)☒ Claim(s) *13-17,19-27 and 29-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 July 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. Receipt is acknowledged of the Amendment filed on February 20, 2008. Claims 1-12 are canceled, and claims 13-32 are pending in the application.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 13, 19, 22, 23, 29 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. (US 6,433,560 B1).

Hansen et al. teaches a combined fluid condition monitor and fluid level sensor comprising:

With regard to claim 13, a method of measuring the quality and/or degradation of a fluid, for measuring the quality and/or the degradation of a fluid (intended use for food oil) including immersing a sensor (FIG. 1, sensor probe 22) in said fluid to be measured, said sensor comprising at least one pair of electrodes (FIG. 1, excitation electrodes 28, 30 and current sensing electrode 32) spaced apart from each other and extending in substantially the same plane, each electrode of each pair of electrodes further having the shape of a comb having a plurality of substantially parallel teeth, the teeth of one of the electrodes being interdigited with the teeth of the other electrode (FIG. 1, structure of probe 22), the electrodes and said fluid forming a

measuring capacitive element (FIG. 1, probe 22, or excitation electrodes 28, 30 and current sensing electrode 32, in direct contact with the fluid) whose capacitance varies as a function of the dielectric constant of the fluid, said sensor providing an electrical output signal (sensed current signal sensed by the probe 22 in fluids of varying impedances or capacitances) representative of said dielectric constant (the dielectric constant has a correlation with the capacitance by a well known formula C = k*E*(A/d)), and receiving said output signal and determining the degree of quality and/or degradation of said fluid on the basis of said output signal (performed by controller 26 in FIG. 1), wherein both sides of the electrodes are immersed in the fluid, on either side of said plane such that said oil can flow passing through said plane (FIG. 1) (Column 3, lines 28-62 and column 6, lines 2-23).

With regard to claim 23, a cooking apparatus including a vat for containing a cooking fluid and heating means (not given patentable weight because of intended use, and those skilled in the art will realize that such modifications are intended to be within the scope and spirit of the invention of the applied prior art), wherein it further includes a device (FIG. 1, combined level sensing and fluid monitoring system 20) for measuring the quality and/or degradation of a fluid, said measuring device including a sensor (FIG. 1, sensor probe 22) having at least one pair of electrodes (FIG. 1, excitation electrodes 28, 30 and current sensing electrode 32) spaced apart from each other and extending in substantially the same plane, each electrode of each pair of electrodes further having the shape of a comb having a plurality of substantially parallel teeth, the teeth of one of the electrodes being interdigited with the teeth of the other electrode (FIG. 1, structure of probe 22), the electrodes and said fluid forming a measuring capacitive element (FIG. 1, probe 22, or excitation electrodes 28, 30 and current sensing electrode 32, in direct

contact with the fluid) whose capacitance varies as a function of the dielectric constant of the fluid, said sensor being capable of providing an electrical output signal (sensed current signal sensed by the probe 22 in fluids of varying impedances or capacitances) representative of said dielectric constant (the dielectric constant has a correlation with the capacitance by a well known formula C = k*E*(A/d)), and processing means (FIG. 1, controller 26) receiving said output signal and capable of determining the degree of quality and/or degradation of said fluid on the basis of said output signal, the measuring capacitive element being arranged in said vat (FIG. 1, reservoir 24) such that both sides of its electrodes are immersed in the fluid on either side of said plane of the electrodes so that said fluid can flow passing through said plane (Column 3, lines 28-62 and column 6, lines 2-23).

Hansen et al. teaches all that is claimed as discussed above, but it does not specifically teach the following feature:

- An air gap between adjacent ones of said teeth to be between 1 nm and 1mm.

However, the feature upon which applicant relies (i.e., air gap between adjacent ones of said teeth to be between 1 nm and 1mm) is not sufficient by itself to patentably distinguish over Hansen et al. According to Optimization within Prior Art Conditions or Through Routine Experimentation section in MPEP, "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re* Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed at a

temperature of 100°C and an acid concentration of 10%.); see also Peterson, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); *In re* Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969) (Claimed elastomeric polyurethanes which fell within the broad scope of the references were held to be unpatentable thereover because, among other reasons, there was no evidence of the criticality of the claimed ranges of molecular weight or molar proportions.). For more recent cases applying this principle, see Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); *In re* Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and *In re* Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). This support can be found in MPEP § 2144.05, II. OPTIMIZATION OF RANGES.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the combined fluid condition monitor and fluid level sensor of Hansen et al. to incorporate the teaching of selecting an air gap between adjacent ones of the teeth to be between 1 nm and 1mm or between any certain range which may vary from sensor to sensor since such an arrangement is beneficial to provide a desirable and exemplary choices for a specific configuration of the sensor.

With regard to claims 19 and 29, the electrodes are respectively formed by flat plates (FIG. 2, excitation electrodes 28, 30 and current sensing electrode 32). The modification of the primary references as discussed above would result in the claimed feature.

With regard to claims 22 and 32, the electrodes (FIG. 5, excitation electrodes 228, 230 and current sensing electrode 232) of the capacitive elements are carried by an electrically insulating support structure (FIG. 5, hollow tubular support 223) having an aperture (FIG. 5, aperture 225) opposite a measuring region of said electrodes (Column 6, lines 28-31). The modification of the primary references as discussed above would result in the claimed feature.

4. Claims 14-17 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. in view of Schoess (US 6,718,819 B2).

Hansen et al. teaches all that is claimed as discussed in the above rejection of claims 13, 19, 22, 23, 29 and 32 including a measuring capacitive element (FIG. 1, probe 22, or excitation electrodes 28, 30 and current sensing electrode 32, in direct contact with the fluid), but it does not specifically teach the following:

- A reference capacitive element (having a similar structure to that of the measuring capacitive element).

Schoess teaches an oil quality sensor system comprising:

With regard to claims 14 and 24, providing the sensor with a reference capacitive element (FIG. 4, first sensor 315 immersed in new, clean oil sample 304) comprising at least one pair of reference electrodes (FIG. 4) spaced apart from one another, said reference capacitive element being intended to be immersed in a reference oil (FIG. 4, new, clean oil sample 304), the reference electrodes and the reference fluid forming a reference capacitive element (FIG. 4, first sensor 315 immersed in new, clean oil sample 304) whose capacitance varies as a function of the dielectric constant of the reference oil, said reference capacitive element being capable of providing a reference signal (sensed current signal sensed by the current follower amplifier in

fluids of varying impedances or capacitances) representative of said reference dielectric constant to said processing means (FIG. 4, digital oscilloscope 308), and wherein the processing means are arranged for comparing the output signal (FIG. 5, from used oil sample) to the reference signal (FIG. 5, from new oil sample) (From column 6, line 35 to column 7, line 8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined fluid condition monitor and fluid level sensor of Hansen et al. to incorporate the teaching of employing a reference capacitive element taught by Schoess since Schoess teach that such an arrangement is beneficial to provide for an on-board sensing system will determine the oil's condition, and will trigger a trouble code if the equivalent voltage falls within a predetermined range as disclosed in Abstract.

With regard to claims 15 and 25, the reference capacitive element has a similar structure to that of the measuring capacitive element; therefore, the modification of the primary references as discussed above would result in the claimed feature.

With regard to claims 16 and 26, Schoess teaches that the reference fluid (FIG. 4, new, clean oil sample 304) is arranged in an enclosed space (FIG. 4, container containing new, clean oil sample 304) insulated from said oil to be measured and in thermal contact with the latter, such that the reference oil has substantially the same temperature as said oil to be measured (FIG. 4). The modification of the primary references as discussed above would result in the claimed feature.

With regard to claims 17 and 27, Schoess teaches that the enclosed space (FIG. 4, container containing new, clean oil sample 304) containing the reference oil (FIG. 4, new, clean

oil sample 304) is associated with a system for renewing said reference oil (FIG. 4). The modification of the primary references as discussed above would result in the claimed feature.

5. Claims 20 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. in view of Pchelnikov et al. (US 6,293,142 B1).

Hansen et al. teaches all that is claimed as discussed in the above rejection of claims 13, 19, 22, 23, 29 and 32 including the capacitive elements (FIG. 1, probe 22, or excitation electrodes 28, 30 and current sensing electrode 32, in direct contact with the fluid) are surrounded by a frame (FIG. 1, vessel 24) forming a screen against electromagnetic interference, but it does not specifically teach the following:

- A metal frame.

Pchelnikov et al. teaches an electromagnetic method of liquid level monitoring comprising:

With regard to claims 20 and 30, a metal container (FIG. 2, container 2) is filled with liquid (Column 3, lines 64-65 and column 6, lines 3-6).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined fluid condition monitor and fluid level sensor of Hansen et al. to incorporate the teaching of employing a metal container taught by Pchelnikov et al. since such an arrangement is beneficial to provide for an alternative design choice for a combined fluid condition monitor and fluid level sensor for an intended use.

6. Claims 21 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. in view of Klun et al. (US 6,469,521 B1).

Hansen et al. teaches all that is claimed as discussed in the above rejection of claims 13, 19, 22, 23, 29 and 32 including electrodes (FIG. 1, excitation electrodes 28, 30 and current sensing electrode 32) of the measuring capacitive elements (FIG. 1, probe 22, or excitation electrodes 28, 30 and current sensing electrode 32, in direct contact with the fluid), but it does not specifically teach the following:

- The electrodes made from a food grade steel.

Klun et al. teaches a method for measuring the state of oils or fats comprising:

With regard to claims 21 and 31, the electrodes (FIG. 1a, electrodes inside sensor 5) of the capacitive elements are made from a food grade steel (fine gold) (Column 3, lines 21-42 and column 6, lines 28-31).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined fluid condition monitor and fluid level sensor of Hansen et al. to incorporate the teaching of employing electrodes made from a food grade steel taught by Klun et al. since Klun et al. teach that such an arrangement is beneficial to provide for a measuring device to be safely used with foods as disclosed in column 3, lines 21-42.

## *Allowable Subject Matter*

7. Claims 18 and 28 are allowed.

8. The following is an examiner's statement of reasons for allowance: please see the previous Office Action mailed on August 21, 2007 for the examiner's statement of reasons for allowance.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Response to Arguments*

9. Applicant's arguments with respect to claims 13-17, 19-27 and 29-32 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

## CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAI-AN D. NGUYEN whose telephone number is (571) 272-2170. The examiner can normally be reached on M-F (8:00 - 5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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